

## 生物策略表

類別	生物策略 (Strategy)
生物策略 STRATEGY	蟻丘增加生物多樣性 (Mounds Increase Diversity)
生物系統 LIVING SYSTEM	蟻丘白蟻 (Mound-building termites)
功能類別 FUNCTIONS	#應付群落中的擾動 #Manage Disturbance in a Community #控制沖蝕及沉積 #Control Erosion and Sediment #循環養分 #Cycle Nutrients #維持生物多樣性 #Maintain Biodiversity
作用機制標題	<p>某些白蟻所建構的蟻丘在濕地中增加生物多樣性，因為它們形成了「島嶼」，可以在雨季期間支撐樹木及其他物種的生長。</p> <p>The mounds created by some termites increase diversity in wetlands because they form 'islands,' supporting trees and other species during the wet season.</p>
生物系統/作用機制 示意圖 (確認版權、註明出處；畫質)	 <p>出處：<a href="https://pixabay.com/photos/termite-mounds-ants-landscape-695209/">https://pixabay.com/photos/termite-mounds-ants-landscape-695209/</a></p>
作用機制摘要說明 (SUMMARY OF FUNCTIONING MECHANISMS)	
<p>「在歐卡萬哥三角洲，白蟻丘是許多樹島的起源。蟻丘白蟻 (<i>Macrotermes michaelseni</i>) 會在季節性淹水區的長期乾旱期間建造地下巢穴。這些巢穴最終會由塔狀結構覆蓋，形成蟻丘，而內部具有通道支撐、通氣。這些蟻丘可達 4 公尺高，基底面積可達 50 平方公尺 (Dangerfield 等, 1998)。白蟻群落</p>	

透過移動細小的土壤顆粒來建構蟻丘，進而改變當地的地形與濕地土壤的質地特性。此外，白蟻也會將有機物質帶入巢穴，促進局部的養分再分配。由於白蟻蟻丘的高度超過泛濫平原的水位，樹木能在蟻丘上生長。在雨季期間，白蟻群落可能會死亡，但蟻丘上的樹木仍能存活，因為它們的生長位置高於平均水位。樹木會吸引鳥類及其他動物前來，這些動物會攜帶種子與養分至新形成的樹島。因此，這些樹島成為生物多樣性熱點，各種植物與動物在此定居或利用該區域。」（van der Valk, 2006:104）

「許多生物的活動會創造、改變資源流動，進而影響現有與未來的生物多樣性組成與分佈空間。這種現象被稱為生態系統工程（ecosystem engineering），其中蟻丘白蟻 *Macrotermes michaelseni* 是一個典型案例。根據研究顯示，這種白蟻在不同的空間尺度上都扮演著生態系統工程師的角色，影響範圍從改變局部的水滲透率到塑造整個景觀嵌合體。其影響之所以能夠累積，是因為白蟻活動會啟動一連串的生物物理過程，而這些過程通常包含反饋機制，進一步強化並延續這些影響。這些對資源流動的改變可能會持續很長時間，並影響棲地的生物結構。研究中也討論了生態系統工程的價值，將其作為一種綜觀的方法來理解熱帶生態系統的複雜性。（Dangerfield 等, 1998:507）

“On the Okavango, the point of formation of many tree islands is a termite mound. Colonies of the mound-building termite (*Macrotermes michaelseni*) build subterranean nests during prolonged dry periods in seasonally flooded areas (Fig. 5.13). These nests are eventually crowned by a turret connected to the nest by a series of air passages. These turrets or mounds can be 4 m tall and have a basal area of 50 m<sup>2</sup> (Dangerfield et al. 1998). Termite colonies redistribute resources by moving fine soil particles to their nests to build up the mound, thus changing the local topography and soil textural properties of the wetland. Termites also carry organic matter to their nests, thus redistributing nutrients locally. Because of their elevation above the floodplain, termite mounds can be colonized by tree species. During the wet season, the termite colonies may be killed. However, any trees on the mounds survive because they are growing above the mean water level. The presence of trees attracts birds and other animals that carry seeds and nutrients to the newly formed island (Fig. 5.13). Consequently, tree islands become biodiversity hotspots that are colonized or used by a variety of plant and animal species.” (van der Valk 2006:104)

“Many organisms create or alter resource flows that affect the composition and spatial arrangement of current and future organismal diversity. The phenomenon called ecosystem engineering is considered

with a case study of the mound building termite *Macrotermes michaelseni*.

It is argued that this species acts as an ecosystem engineer across a range of spatial scales, from alteration of local infiltration rates to the creation of landscape mosaics, and that its impacts accrue because of the initiation of biophysical processes that often include feedback mechanisms. These changes to resource flows are likely to persist for long periods and constrain the biological structure of the habitat. The value of ecosystem engineering is discussed as a holistic way of understanding the complexity of tropical ecology.” (Dangerfield et al. 1998:507)

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#### 文獻引用 (REFERENCES)

N/A

#### 參考文獻清單與連結 (REFERENCE LIST) **Harvard** 或 **APA** 格式

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(<https://www.proquest.com/openview/bbaf85b2caefb488be13f390e1b44b9/1?pq-origsite=gscholar&cbl=196257>)

Dangerfield, J. M., McCarthy, T. S., & Ellery, W. N. (1998). The mound-building termite *Macrotermes michaelseni* as an ecosystem engineer. Journal of tropical Ecology, 14(4), 507-520.

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N/A

#### 生物系統延伸資訊連結 (LEARN MORE ABOUT THE LIVING SYSTEM/S)

N/A

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<https://asknature.org/strategy/mounds-increase-diversity/>